

Claims

1. An isolated truncated Nogo-A polypeptide that corresponds to a truncated form of the Nogo-A protein consisting of the amino acids 174 to 940 of the full length protein of rat Nogo-A (SEQ ID NO: 1, 1163 amino acids) or of the amino acids 246 to 966 of the human full length protein (SEQ ID NO: 2, 1192 amino acids).

2. The polypeptide of claim 1, wherein said truncated form of the Nogo-A protein consists of the amino acids 223 to 940 of the full length protein of rat Nogo-A.

3. The polypeptide of claim 1 or 2, wherein said truncated form is a polypeptide that begins with an amino acid residue selected from the amino acids 174 to 233 and that ends at a residue selected from amino acids 890 to 940 of the full length protein of rat Nogo-A.

4. A polypeptide selected from the group consisting of:

a) the polypeptide having the amino acid sequence consisting of amino acid residues 174 to 940 of the full length rat Nogo-A protein (SEQ ID NO: 1);

b) the polypeptide having the amino acid sequence consisting of amino acid residues 233 to 940 of the full length rat Nogo-A protein (SEQ ID NO:1);

c) the polypeptide having the amino acid sequence consisting of amino acid residues 246 to 966 of the full length human Nogo-A protein (SEQ ID NO:2);

d) a polypeptide having at least 50 % sequence identity to any of the polypeptides a) to c) wherein a fragment of the human Nogo-A protein consisting of amino acids 1 to 1024 is excluded;

e) a fragment of any of the polypeptides a) to d) wherein the fragment consisting of amino acids 624 to 639 of full length rat Nogo-A protein is excluded.

5. A fusion protein consisting of a Nogo-A polypeptide of any of the foregoing claims and a fusion partner fused to the N- and/or the C-terminus of the Nogo-A polypeptide.

6. The fusion protein of claim 5, wherein the fusion partner is a protein, a protein domain or a peptide.

7. A nucleic acid molecule encoding a polypeptide of any of claims 1 to 4 or a fusion protein of any of claims 5 or 6.

8. The nucleic acid molecule of claim 7 comprising the nucleotide sequence of positions 522 to 2822 or of positions 699 to 2822 of the coding sequence of rat Nogo-A deposited under accession number AJ242961 in the EMBL database.

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9. A vector comprising a nucleic acid molecule of claim 7 or 8.

10. A host cell comprising a vector as defined in claim 9.

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11. A method for the production of a Nogo-A polypeptide of any of claims 1 to 4 or a fusion protein of claims 5 or 6, wherein the Nogo-A polypeptide or the fusion protein of the Nogo-A polypeptide is produced starting from the nucleic acid coding for the Nogo-A polypeptide by means of an in vitro transcription and translation system and is isolated from this in vitro system or by means of genetic engineering methods in a bacterial or eucaryotic host organism and is isolated from this host organism or its culture.

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12. The method of claim 11, wherein the Nogo-A polypeptide or fusion protein is produced by periplasmic expression in a bacterial host.

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13. A method for identifying a compound having detectable affinity to a Nogo-A protein, comprising the steps of:

(a) contacting a truncated Nogo-A polypeptide or a fusion protein thereof as defined in any of claims 1 to 7 with a compound of interest under conditions that allow formation of a complex between the truncated Nogo-A protein and said compound; and

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(b) detecting complex formation by means of a suitable signaling method.

14. The method of claim 13, wherein the compound of interest protein is an organic molecule, a peptide, a polypeptide or a nucleic acid.

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15. The method of claim 14, wherein the polypeptide, the peptide or the nucleic acid is subjected to mutagenesis before contacting it with said truncated Nogo-A protein in step a).

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16. The method of any of claims 13 to 15, wherein the polypeptide is selected from the group consisting of antibodies and muteins based on a polypeptide of the lipocalin family.

17. The method of claim 18, wherein the antibody is a mutein derived from the antibody IN-1 or a fragment or fusion protein thereof.

18. The method of any of claims 13 to 18, wherein the compound having binding
5 affinity to a Nogo-A protein has a neutralizing effect on the neurite-growth-inhibiting activity of Nogo-A.

19. A method for identifying a compound having detectable affinity to a Nogo-A protein comprising the steps of:

10 (a) contacting a truncated Nogo-A polypeptide or a fusion protein thereof as defined in any of claims 1 to 7 with a plurality of compounds of interest under conditions that allow formation of a complex between the truncated Nogo-A protein and said compounds; and

15 (b) enriching at least one compound of interest that has detectable binding affinity to the Nogo-A protein by screening or selection and/or isolating said at least one compound.

20 20. The method of claim 19, wherein the plurality of compounds of interest are peptides, a polypeptides or nucleic acids that have been subjected to mutagenesis before contacting it with said truncated Nogo-A protein in step a).

21. An antibody or an fragment thereof having the variable domains of SEQ ID NO: 11 and SEQ ID NO: 12.